

Integration of the F-35C into  
Marine Corps Acquisition Plans

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## INTRODUCTION

In current combat operations, three different Marine Corps fixed-wing platforms provide offensive air support (OAS) in Iraq and Afghanistan. In the near future, the Marine Corps intends to provide air support to the Marine-air-ground-task-force (MAGTF) with a single variant of aircraft, the F-35B Joint Strike Fighter (JSF). By doing so, the Corps will be relying heavily on one aircraft to fulfill the roles of multiple platform capabilities. While operating from either a forward operating base (FOB), or from the flight deck of a ship, the Marine Corps needs to scrutinize the capabilities of the aircraft carrier variant F-35C.

Historically, the MAGTF has relied on many aircraft for supporting troops on the ground. In the 1960's, the Marine Corps possessed the capabilities provided by the A-4 Skyhawk, the F-4 Phantom, and the A-6 Intruder.<sup>1</sup> Modern strike aircraft such as the AV-8B Harrier II and the F/A-18C/D Hornet support the MAGTF today. The introduction of the JSF will present a few challenges. The F-35B Short Take-Off Vertical Landing (STOVL) model, designed mostly for close air support (CAS) missions, will have a hard time fulfilling all of the above platforms' capabilities.

Having the F-35C, similar to the STOVL, but able to bring another fist to the fight, will ease the burden of future demands. The F-35C (Carrier) variant's largest advantage is its ability to perform long-range strikes deep into enemy territory.<sup>2</sup> As the Marine Corps tailors the MAGTF to counter irregular threats, it cannot afford to compress capabilities of multiple aircraft into a single asset. Warfighting capabilities in the Navy and Marine Corps will be broadened if the Marine Corps maintains two types of fighter aircraft in its inventory. The Marine Corps must incorporate the F-35C variant into future acquisition and tactical air (TACAIR) integration plans because its longer strike ranges, greater ordnance payloads, longer on-station time, and aircraft carrier suitability enhance supportability to the Marines on the ground.

## RANGE

The Marine Corps must capitalize on the F-35C's ability to fly longer ranges on strike missions. The STOVL variant has a combat radius of 450 nautical miles, while the C-variant boasts an impressive 640 nautical miles.<sup>3</sup>

<sup>2</sup>Enhanced by the Navy and our global fleet presence, JSF

can deliver relevant, adaptable effects whether launched from a big deck carrier, an L-class deck, or a tactical FOB."<sup>4</sup> The advertised range of the F-35B is twice as long as the Harrier's, but less than the current F/A-18 combat radius of 550 nautical miles.<sup>5</sup> The Marine Corps has historically maintained aircraft with different ranges and different missions. The current flaw is in the dependency of the platform. Relying on the range offered by one type of aircraft will be asking too much out of the aircraft. The MAGTF commander may need a longer strike capability depending on the situation. By having two different variants operating from either amphibious ships or forward operating bases, Marine Corps strike-fighter aircraft will be able to project long range combat power (F-35C) and land on 3,000-foot runways (F-35B) inland. The F-35C operating from an aircraft carrier will accomplish the long-range requirements.

#### **ORDNANCE PAYLOAD**

While flying into foreign territory at longer ranges, the F-35C will also be able to provide ground forces with a greater weapons payload. In reference to combined arms integration, MCDP 1-0 states, "MAGTF's deliver desired

effects...with simultaneity and **depth across the spectrum of operations.**<sup>6</sup> The Marine Corps will achieve this "depth" with the F-35C because of its internal weapons payload of eighteen thousand pounds -- three thousand pounds more than the F-35B.<sup>7</sup> The aircraft carrier variant is capable of carrying a pair of two thousand pound bombs in its internal weapons bay, while the STOVL variant is limited to one thousand pound bombs.<sup>8</sup> The difference in payload is critical in providing OAS to a MAGTF. On initial long-range strikes as part of an amphibious assault, for example, Marine Corps air strike assets must have the flexibility to carry a variety of ordnance loads in order to adapt to unknown threats. By having only a single variant, the Marine Corps will be limiting its power projection ability. Future acquisition plans must account for the fact that the carrier variant will bring more ordnance flexibility to the MAGTF commander.

#### **ON-STATION TIME**

The ability to provide longer periods of air support is critical to supporting the ground forces. The F-35C, because of its greater internal fuel load, will have more time to service the needs of the ground forces. Along

with bringing more ordnance to the fight, the F-35C carries twenty thousand pounds of internal fuel, exceeding the F-35B by six thousand pounds.<sup>9</sup> By having an 8-foot longer wingspan and a 160 sq-ft increase in wing surface area, the F-35C has greater endurance capabilities when compared to the STOVL model.<sup>10</sup> These dimensions increase the amount of loiter time when supporting ground troops. Strike fighter aircraft frequently transit long ranges to reach the ground combat elements. Having more fuel available will mean less time spent away from the supported elements, and more time to respond to threats. The Commandant of the Marine Corps, General Conway, points out in his Strategic Vision 2025 that, "We will: 1. Operate forward with a regional focus, yet be globally capable. 2. Execute persistent forward engagements and security cooperation activities.

3. Respond swiftly, with little warning, to emerging crises."<sup>11</sup> The F-35C supports this vision. The F-35C's longer endurance capability will ensure more air support that will complement any support gaps of the STOVL version. A longer time on station gives the ground element time to link ground situational awareness with that particular strike aircraft, resulting in a higher probability of kill. Operating two different variants from aircraft carriers and

from expeditionary airfields will combine the strengths of both variants in conducting combat missions, and will ultimately give the Marine Corps more time to project power ashore.

#### **TACAIR INTEGRATION**

Having a variant similar to the Navy will allow the Marine Corps to fulfill future TACAIR integration requirements more effectively. The Marine Corps will also be able to fight more successfully alongside the Navy F-35 squadrons. In 2002, the Secretary of the Navy decided to combine the warfighting capabilities of the Navy and Marine Corps by supplementing Navy air wings with Marine fighter squadrons while sending Navy squadrons to Japan to fulfill the Marine Corps' Western Pacific deployment requirements.<sup>12</sup> TACAIR integration is still in effect today. At the time of this writing, three Marine Corps squadrons are aircraft carrier qualified. As part of future TACAIR integration, Marine Corps aviation must still integrate squadrons aboard aircraft carriers. With the F-35C, the Navy will be able to fulfill parts of the Marine Corps' missions while few Marine Corps squadrons will fulfill deployment requirements of the Navy squadrons aboard aircraft carriers. Overall,

having a variant similar to the Navy will enhance the lethality of the Navy/Marine Corps team.

#### **AIRCRAFT CARRIER SUITABILITY**

Designed for shipboard operations, the F-35C grants a simpler process to deploy Marine squadrons aboard the aircraft carrier. The F-35B currently is not suitable for flight deck operations aboard an aircraft carrier. Flight decks are complex as it is managing seven different type, model, and series of aircraft organic to the Navy air wing. Currently, no material provisions exist for flight decks to support the F-35B STOVL model's high temperature landing signature. As far as aircraft carrier landing pattern specifics, the F-35C's advantage in fuel capacity will aid in "blue water" operations, situations in which no divert airfields exist because of the ship's position. A typical "cycle" on an aircraft carrier launches ten to twelve aircraft in ten minutes and subsequently recovers the same amount of airplanes in the same amount of time. Additionally, the average interval between each aircraft recovering in a typical landing cycle is 45-60 seconds.

The F-35B will adversely impact this cyclic operation because the flight deck will have to set aside unavailable time slots and designate STOVL compatible landing areas in order to perform launch and recovery operations. The F-35C is the suitable fix for aircraft carrier flight deck operations.

#### COUNTERARGUMENT

The F-35B is currently the only variant in the acquisition plans for the Marine Corps. A single variant will be capable of providing all functions of support of the legacy strike platforms. But why would the Marine Corps, a force "trained and...focused on executing sustainable expeditionary operations"<sup>13</sup> rely on one aircraft to combat future irregular threats? As an expeditionary force, the Marine Corps must be able to adapt to any type of threat. Many aircraft have been historically relied upon to counter these threats. Condensing capabilities into one type of fighter aircraft is not a feasible solution. The Marine Corps needs an aircraft carrier variant to complement the capabilities of the STOVL variant in order to bring two asymmetric tools to the fight.

The F-35C costs two million dollars more than the F-35B. By only purchasing a single variant, the Marine Corps will require more maintenance support as a stand-alone force. With the combination of having a variant similar to the Navy, and fulfilling TACAIR integration requirements, the Marine Corps will reduce long-term costs. The additional capabilities offered by the F-35C will provide the Marine Corps with another tool for combating terrorism, which makes it worth the extra cost.

## **CONCLUSION**

Future Marine aviation will be a stronger warfighting force if two variants of the JSF are acquired. Historically, the Marine Corps has relied on multiple types of aircraft for combat missions. The Commandant of the Marine Corps, General Conway, emphasizes that, "Our future Corps will be increasingly reliant on naval deployment...we will excel as the Nations expeditionary force of choice."<sup>14</sup> The F-35B is capable of operating from small landing sites well forward of friendly positions. The F-35C is able to launch from a distance behind the MAGTF's rear battle area and project more combat power at longer ranges. Combining the capabilities of the two aircraft will improve the power

of the MAGTF. The current threat forces the Marine Corps to adapt to changing tactics, and by having more tools in the arsenal, the Marine Corps will be in a better position to execute expeditionary warfare.

Notes

1. Charles James Heatley, *Forged In Steel: US Marine Corps Aviation* (Charlottesville: Howell Press Inc, 1987), 201.
2. John Pike, *F-35C Carrier Variant Joint Strike Fighter*, <http://www.globalsecurity.org/military/systems/aircraft/f-35c.htm>.
3. Major Mathew Taylor, F-35 Joint Program Office email message, December 4, 2008.
4. BGen Jon M Davis, "Expeditionary JSF Benefits" (diss., Expeditionary Warfare School, 2008, Power Point presentation).
5. John Pike, *F-35 JSF Lighting II*, <http://www.globalsecurity.org/military/systems/aircraft/f-35-specs.htm>.
6. Department of the Navy, *Marine Corps Operations*, 2001 (Washington, D.C.:2001), 2-3.
7. Ibid, Taylor.
8. Ibid, Taylor.
9. Ibid, Taylor.
10. Ibid, Pike.
11. Gen James T Conway, "Marine Corps Vision and Strategy 2025, Executive Summary," *Marine Corps Gazette* Vol 92, No. 10 (2008): A-7.
12. Otto Kreisher, "TACAIR Integration Hits the Wall," *Air Force Magazine* 90, no. 4 (2007): 52.
13. Ibid.
14. Ibid, Conway, A-8.

Bibliography

Conway, James Gen. "Marine Corps Vision and Strategy 2025." *Marine Corps Gazette* Vol. 92, no. 10 (2008): A-7,8.

Davis, Jon M BGen. "Expeditionary JSF Benefits." diss., Expeditionary Warfare School, 2008.

Department of the Navy. *Marine Corps Operations*, 2001. Washington D.C.: 2001.

Heatley, Charles James. *Forged In Steel*. Charlottesville: Howell, 1987.

Kreisher, Otto. "TACAIR Integration Hits the Wall." *Air Force Magazine* 90, no. 4 (2007): 52-56.

Pike, John. *F-35C Carrier Variant Joint Strike Fighter*, <http://www.globalsecurity.org/military/systems/aircraft/f-35c.htm>

Pike, John. *F-35 JSF Lighting II*, <http://www.globalsecurity.org/military/systems/aircraft/f-35-specs.htm>.

